ASSIGNMENT 3

Textbook Assignment: "JP-5 Afloat Below Deck Systems and Operations (continued)," chapter 4, pages 4-13 through 4-65.

3-1. The centrifugal pump used in the JP-5 service system is rated at what capacity?

1. 20 gpm
2. 150 gpm
3. 1,100 gpm
4. 1,500 gpm

3-2. The centrifugal pump casing is divided into how many chambers?

1. One discharge and two suction
2. One suction and two discharge
3. Two discharge and two suction
4. One discharge and one suction

3-3. The centrifugal pump has four wearing rings. Two wearing rings are installed in the pump casing between the suction and discharge chambers. Where are the other two wearing rings installed?

1. On the pump shaft
2. In the discharge chamber
3. In the suction chamber
4. On the impeller

3-4. What is the purpose of wearing rings?

1. To act as bearings for the pump shaft
2. To minimize leakage between the suction and discharge chambers
3. To allow for the wear created between the impeller and pump casing
4. Both 2 and 3 above

3-5. The centrifugal pump impeller is centered and secured in the pump casing by what devices?

1. Shaft sleeves and wearing rings
2. Shaft sleeves and shaft nuts
3. Bearing caps and shaft nuts
4. Bearing caps and shaft sleeves

3-6. What devices prevent fuel from leaking out of the pump case around the pump shaft?

1. Mechanical seals
2. Shaft collars
3. Flinger rings
4. All of the above

3-7. Mechanical seals are used because of their durability and will not often break, even if they are dropped on a hard surface.

1. True
2. False

3-8. The ball bearings on the centrifugal pump shaft are lubricated by what means?

1. The circulating JP-5
2. Self-priming oil pump
3. Grease fittings
4. Oil reservoir

3-9. Rotary vane pumps used for stripping are designed to pump approximately how many gallons per minute and at what pressure?

1. 50 gpm at 25 psi
2. 50 gpm at 50 psi
3. 200 gpm at 25 psi
4. 200 gpm at 50 psi

3-10. Rotary vane pumps used for transferring are designed to pump approximately how many gallons per minute at what pressure?

1. 50 gpm at 25 psi
2. 50 gpm at 50 psi
3. 200 gpm at 25 psi
4. 200 gpm at 50 psi

3-11. On a rotary vane pump, which component houses the ball bearings and mechanical seals?

1. Cylinder
2. Cylinder heads
3. Rotor and shaft assembly
4. Cylinder bore

3-12. To allow for the escape of liquid between the vanes and-slots of the rotor, the vanes have relief grooves on the

1. forward faces
2. rear faces
3. outside tips
4. inside tips

A. Rex chain

B. Direct drive

C. Falk type-F steelflex

D. Lovejoy

FIGURE 3-A

IN ANSWERING QUESTIONS 3-13 THROUGH 3-15, SELECT FROM FIGURE 3-A THE TYPE OF PUMP COUPLING DESCRIBED IN THE STATEMENT.

3-13. The coupling halves are cushioned by a formed rubber spider.

1. A
2. B
3. C
4. D

3-14. A flexible gridmember engages the teeth in the hubs to transmit power.

1. A
2. B
3. C
4. D

3-15. It resembles small bicycle sprockets placed side by side with a double wide chain connecting the two.

1. A
2. B
3. C
4. D

3-16. Which type of valve is most commonly used for throttling fuel flow?

1. Globe
2. Gate
3. High performance butterfly
4. Rotary plug

3-17. What valve design allows no metal-to-metal contact during regular operations?

1. A globe
2. A gate
3. A high performance butterfly
4. A rotary plug

3-18. What valve should be used where a straight flow with a minimum amount of restriction is desired?

1. A globe
2. A gate
3. A high performance butterfly
4. A modified globe

3-19. What component on the limitorque valve operator operates the OPEN and CLOSE position indicator lights for the valve?

1. The handwheel
2. The console relay switch
3. The valve stem
4. The limit switches

3-20. If a one-way check valve has no directional flow arrow, how can You identify which end is the inlet?

1. It will have female threads
2. It will have male threads
3. It will have the hinge pin
4. It is the side without the hinge pin

3-21. Valve manifolds are made up of what type of modified valve?

1. Globe
2. Gate
3. One-way check
4. Rotary plug

3-22. What device ensures the disk is centered into the base of the valve body in a manifold?

1. Valve stem
2. Gate guide
3. Plug guide
4. Disk guide

3-23. What device prevents leakage around the valve stem of a manifold?

1. O-ring
2. Gasket
3. Packing
4. Plug

3-24. On a manifold, what is the name of the pipe connecting the mainside valve to the tankside valve?

1. Nozzle
2. Coupler
3. Flange joint
4. Tube

3-25. When tanks are ballasted, what must be done to the tankside valve?

1. It must be pinned closed
2. It must be bolted closed
3. It must be locked closed
4. It must be tagged closed

3-26. What type of manifold should be used for the tanktop valves in the stripping system?

1. Double-valved manifold
2. Single-valved manifold
3. Flood and drain manifold
4. Sliding gate manifold

3-27. Which of the following is NOT a function of the flood and drain manifold?

1. Stripping
2. Transferring
3. Ballasting
4. Deballasting

3-28. What device on the flood and drain manifold allows only one valve to be opened at a time?

1. A rotating hook locking device
2. A pinning device
3. A latch-type locking device
4. A sliding bar locking device

3-29. What are the three chambers inside the fuel filter?

1. Sump, separator, and outlet
2. Sump, separator, and inlet
3. Inlet, sump, and outlet
4. Inlet, fallout, and outlet

3-30. What components are inserted in the threaded holes that are symmetrically arranged over the surface of the tube sheets?

1. Coalescer elements
2. Filter element mount assemblies
3. Separator elements
4. Vent lines

3-31. Leakage is prevented at the ends of the filter elements by the

1. smooth surface of the end caps forming a tight seal with rubber gaskets on the elements
2. fiber washers on the elements forming a tight seal against the knife edges on the end caps
3. end caps of the elements being assembled with fiber washers to form a tight seal
4. knife edges on the end caps projecting into the synthetic rubber gaskets on the elements

3-32. In what direction does fuel flow through the coalescer element?

1. Outside to inside
2. Inside to outside
3. Top to bottom
4. Bottom to top

3-33. Separator elements are considered permanent elements and are not replaced unless they become damaged.

1. True
2. False

3-34. When fuel flows from the coalescer elements to the separator elements, the coalesced water falls out of the fuel by gravity. In which chamber does this take place?

1. Outlet
2. Inlet
3. Fallout
4. Water receiving sump

3-35. The manhole cover installed on the side of the filter allows entrance to which chamber?

1. Outlet
2. Inlet
3. Fallout
4. Water receiving sump

3-36. Fuel passing from the fallout chamber to the outlet chamber must go through the

1. coalescer elements
2. separator elements
3. sump
4. water drain valve

3-37. The separator elements have the capability to only filter solid contaminants larger than how many microns?

1. 1
2. 5
3. 10
4. 20

3-38. The rotary control valve is bolted to what part of the filter?

1. Inlet chamber
2. Fallout chamber
3. Outlet chamber
4. Water receiving sump

3-39. What devices are provided to determine the pressure drop across the filter elements?

1. Air gates
2. Pressure gages
3. Sight glasses
4. Flow indicators

3-40. What is the rated capacity of the service fuel filter?

1. 1,100 gpm
2. 2,000 gpm
3. 2,100 gpm
4. 2,400 gpm

3-41. What is the typical pressure drop limit on the fuel filter?

1. 10 psi
2. 15 psi
3. 17 psi
4. 20 psi

3-42. Filter samples should be taken at the start of the initial flow and at what intervals thereafter?

1. Every 10 minutes
2. Every 15 minutes
3. Every 30 minutes
4. Every 60 minutes

3-43. What provides a cushioning effect when the automatic shutoff valve is opened by the filter discharge pressure acting under the valve seat?

1. A tension spring in the lower valve chamber
2. A tension spring in the upper valve chamber
3. Fuel pressure acting on the bottom of the diaphragm
4. Fuel pressure acting on the top of the diaphragm

3-44. When the eductor causes a decrease in fuel pressure on top of the diaphragm of the shutoff valve, how will the shutoff valve be affected?

1. The filter discharge pressure will open the valve
2. The filter discharge pressure will close the valve
3. The tension spring will close the valve
4. The increase in filter discharge pressure applied to the top of the diaphragm will open the valve

3-45. What causes the automatic shutoff valve to close when the pilot valve closes?

1. Fuel pressure acting on the bottom of the diaphragm in the automatic shutoff valve
2. Fuel pressure being directed through the eductor suction line to the top of the cover chamber of the automatic shutoff valve
3. Fuel pressure being directed to the top of the diaphragm in the automatic water drain valve
4. Fuel pressure being directed to the bottom of the diaphragm in the automatic water drain valve

3-46. What are the operating positions of the rotary control valve?

1. Down and up only
2. Down and horizontal only
3. Horizontal and up only
4. Down, horizontal, and up

3-47. What valve directs filter pressure through its ports to the tops of the diaphragms of the pilot and automatic water drain valves?

1. The pilot valve
2. The automatic shutoff valve
3. The rotary control valve
4. The automatic water drain valve

3-48. When there is little to no water passing through the fuel filter and the ball float is in the DOWN position, the rotary control valve directs filter pressure to. and vents it to, which valves?

1. Directs to the top of the water drain valve and vents the top of the pilot valve
2. Directs to the bottom of the water drain valve and vents the top of the pilot valve
3. Directs to the top of the water drain valve and vents the bottom of the water drain valve
4. Directs to the top of the automatic shutoff valve and vents the top of the water drain valve

3-49. When all valves of the filter hydraulic system are open and coalesced water is draining from the sump, in what position will the ball float be?

1. Down
2. Vertical
3. Horizontal
4. Up

3-50. Under which of the following conditions will the pilot and automatic shutoff valves be closed?

1. The float is in the DOWN position with no water drainage required
2. The float is in the HORIZONTAL position and the accumulated water is draining
3. The float is in the UP position and the accumulated water is not draining fast enough
4. During normal operations

3-51. Which of the following is often the most likely cause of a filter hydraulic control system failing to operate properly?

1. Manually operated valves improperly aligned
2. The tubing has obstructions or is dented
3. The automatic valves are improperly installed
4. Too much water in the fuel

3-52. During centrifugal purifier operations, where will the solid contaminants be collected after they are separated from the fuel?

1. In the heavy phase outlet
2. On the underside of the disks
3. On the outer edge of the disks
4. On the inside bowl wall

3-53. What part of the purifier acts as a pump?

1. The tubular shaft
2. The paring disk
3. The intermediate disks
4. The distribution holes in the intermediate disks

3-54. What are the ideal operating pressures of the centrifugal purifier?

1. 9 psi inlet and 25 psi outlet
2. 9 psi inlet and 30 psi outlet
3. 9 psi inlet and 35 psi outlet
4. 30 psi inlet and 9 psi outlet

3-55. When the purifier bowl has to be cleaned, which components allow the cover assembly to be rotated open without disconnecting the piping?

1. The cover hinge, inlet, and outlet assembly
2. The feed tube assembly and cover hinge
3. The feed tube assembly and ratchet hook
4. The cover hinge and ratchet hook

3-56. During purifier operations, impure JP-5 is directed into the bowl and purified JP-5 is directed out of the bowl by what force or component?

1. The seal water inlet valve
2. Centrifugal force
3. The feed tube assembly
4. The regulating tube

3-57. What part of the purifier is the shaft for the paring disk?

1. Regulating tube
2. Feed tube
3. Tubular shaft
4. Drive shaft

3-58. The feed tube screws into what device?

1. The feed tube assembly
2. The outlet tube
3. The paring disk
4. The tubular shaft

3-59. What device(s) prevent(s) the purifier from rotating during disassembly and assembly?

1. Spring-loaded handle
2. Three handwheel cover clamps
3. Lock screws
4. Ratchet hook catch

3-60. What component acts as a shock absorber to absorb vertical thrust of the spindle shaft when the purifier is started?

1. Horizontal spring
2. Vertical spring
3. Horizontal ball bearing
4. Vertical ball bearing

3-61. A total of how many sets of ball bearings support the spindle assembly?

1. Five
2. Two
3. Three
4. Seven

3-62. What components help reduce vibration in the operating purifier?

1. Four vertical springs
2. Six vertical springs
3. Four horizontal springs
4. Six horizontal springs

3-63. If the bowl of the purifier is rotating at 4100 rpm, what should the rpm of the speed counter be?

1. 100 to 130
2. 146 to 150
3. 41
4. 410

3-64. What force or device moves the oil in the oil lubrication compartment to supply lubricating oil to the bearings and gears?

1. An oil pump
2. The worm wheel gear
3. A flinger ring
4. A slinger

3-65. What parts of the tubular shaft keep it off the bowl shell and give circular motion to the feed inlet liquid?

1. 6 outer slots
2. 12 outer holes
3. 12 inner spacers
4. 3 unequal pins

3-66. How are the holes in the intermediate disks aligned vertically in the bowl shell?

1. The notch on the inward lip at the top of each disk interlocks with the key on the tubular shaft
2. The notch on the outer lip at the bottom of each disk interlocks on the tubular shaft
3. The notch on the top on each disk is interlocked with a key on the feed tube assembly
4. The notch at the top of the tubular shaft interlocks with a key on each disk

3-67. What is the normal number of intermediate disks in the disk stack?

1. 127
2. 145
3. 147
4. 150

3-68. Which of the following is the only disk not having holes around its base?

1. Disk #1
2. Disk #127
3. Bottom disk
4. Top disk

3-69. Which disk provides a rotating casing for the centripetal pump?

1. Top disk
2. Coupling disk
3. Intermediate disk
4. Paring disk

3-70. The disk stack is compressed to the correct tension by tightening the

1. spindle nut
2. coupling nut
3. coupling ring
4. discharge ring

3-71. What unique characteristic does the feed tube assembly, coupling ring, and coupling nut all have?

1. Light in weight
2. Each has a serial number to match it to a specific purifier
3. Left-handed threads
4. Right-handed threads

3-72. Each purifier is furnished with seven discharge rings. The inside diameters range from

1. 220 millimeters to 280 millimeters in 10 millimeter increments
2. 220 centimeters to 250 centimeters in 5 centimeter increments
3. 220 millimeters to 250 millimeters in 5 millimeter increments
4. 220 millimeters to 227 millimeters in 1 millimeter increments

3-73. When starting the purifier, it should come up to operating speed within how many minutes

1. 5
2. 7
3. 9
4. 11

3-74. When the purifier is in the standby mode, how often should you check the inlet-outlet housing and bowl cover to make sure they are cool to the touch?

1. Every 5 minutes
2. Every 7 minutes
3. Every 10 minutes
4. Every 15 minutes

3-75. The purifier must be cleaned before the wet cake (accumulated solids) exceeds 30 pounds or what thickness?

1. 1/4 in.
2. 1/2 in.
3. 1 1/4 in.
4. 1 1/2 in.